

# CHAPTER 8



## *Infant and Child Mortality*

**T**he infant mortality rate (the probability of dying between birth and the first birthday, expressed per 1,000 live births), is an important measure of a nation's health status, well-being, and development. Although life expectancy at birth has greatly increased over the past 50 years, around 40 thousand children under five die each year in the four countries considered in this report, many from causes preventable through a combination of good care, nutrition, and medical treatment.

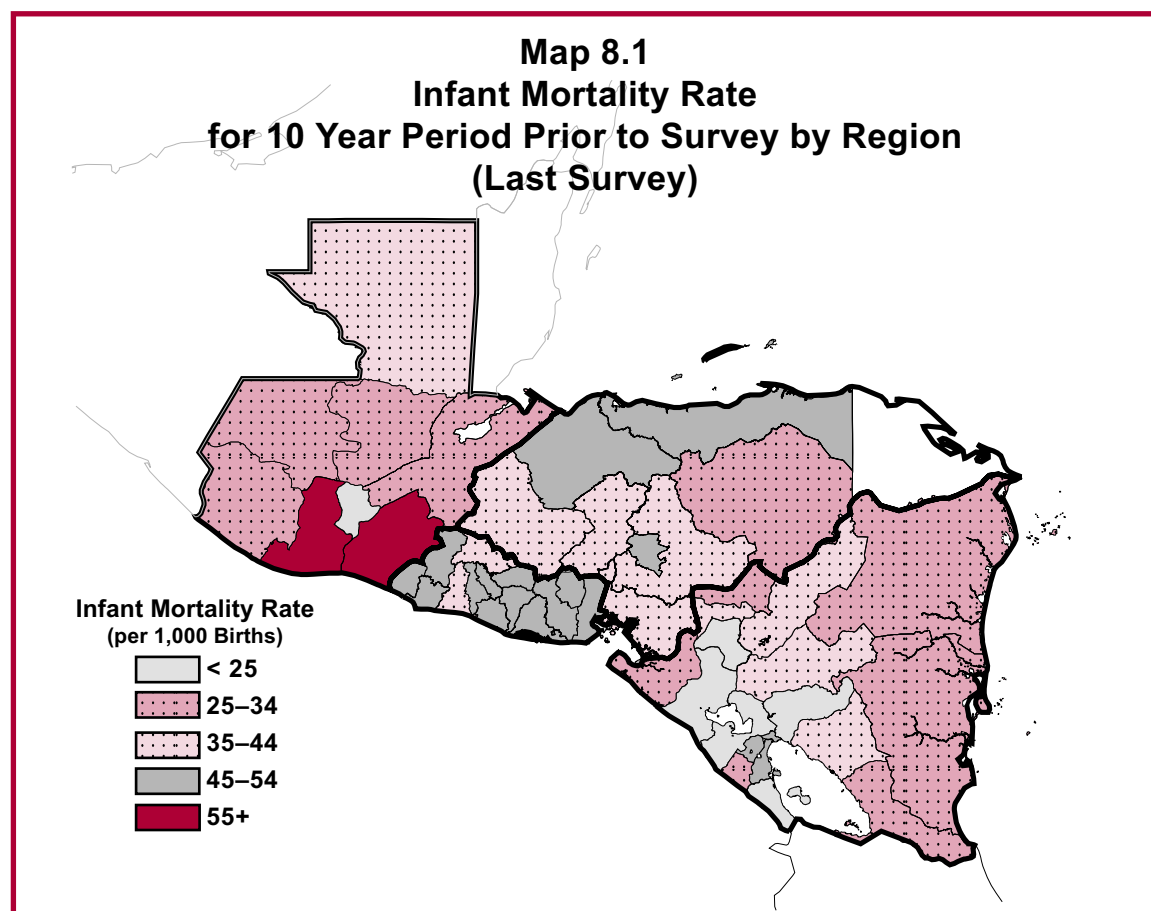
Map 8.1 shows the regional pattern of infant mortality during the 10 year period prior to the last survey in each country. Infant mortality is lowest in the metropolitan area of capital cities in each country. The largest differentials can be seen in Guatemala and somewhat in Nicaragua with more of a spatial gradient from the Pacific-to-Caribbean coast. It is interesting to note the relatively low infant mortality of the northern Caribbean coast of Honduras, on par with the health region of Tegucigalpa.

Table 8.1 and Graph 8.1 show survey mortality estimates for the 5-year periods preceding each of the last 3 surveys in each country. According to the most recent survey, infant mortality levels are highest in Guatemala (39 infant deaths per 1,000 live births) and lowest in El Salvador (25 deaths per 1,000). It should be noted that the infant mortality rates in Honduras and Nicaragua are both over 30 deaths per 1,000.

In each of the countries, the neonatal mortality rate (the probability of dying within the first 27 days of life) is higher than the postneonatal mortality rate (the probability of dying between the 28th day of life and the first birthday). This is not unexpected since, as infant mortality declines, the proportion of that mortality that occurs in the first 27 days of life (neonatal mortality) increases.

The child mortality rate (the probability of dying between exact ages of 1 and 5), ranges from a low of 6 per 1,000 children surviving to age 1 in El Salvador to a high of 15 in Guatemala. Similarly, the under-5 mortality rate (the probability of dying between birth and exact age 5) ranges from 31 in El Salvador to 53 in Guatemala.

All of the countries examined in this report show a systematic decline in levels of infant mortality over the past decade. For example, Nicaragua's infant mortality rate declined by 27 infant deaths

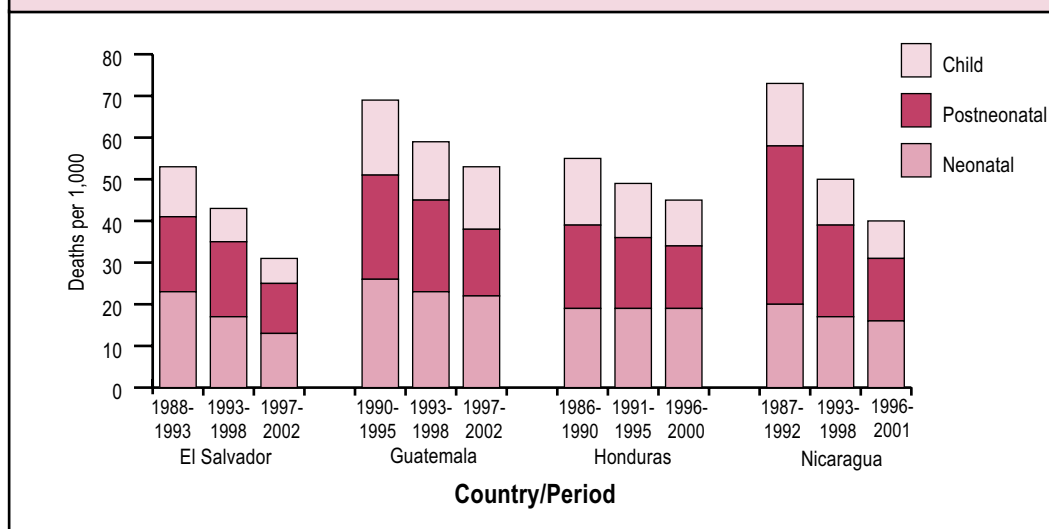


**Table 8.1**  
**Trends in Infant and Child Mortality**

Country	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
El Salvador	1993	1988–1993	23	18	41	12	52
El Salvador	1998	1993–1998	17	18	35	8	43
El Salvador	2002/03	1997–2002	13	12	25	6	31
Guatemala	1995	1990–1995	26	25	51	18	68
Guatemala	1998/99	1993–1998	23	22	45	14	59
Guatemala	2002	1997–2002	22	16	39	15	53
Honduras	1991/92	1986–1990	19	20	39	16	55
Honduras	1996	1991–1995	19	17	36	13	48
Honduras	2001	1996–2000	19	15	34	11	45
Nicaragua	1992/93	1987–1992	20	38	58	15	72
Nicaragua	1998	1993–1998	17	22	39	11	50
Nicaragua	2001	1996–2001	16	15	31	7	38

\* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.

**Graph 8.1**  
**Trends in Under-Five Mortality, Last Three Surveys**



per 1,000 live births between the periods 1987–1992 and 1996–2001, with the sharpest decline occurring between 1987–1992 and 1993–1998. The largest decline in El Salvador's infant mortality rate occurred between 1993–1998 and 1997–2002, while Guatemala's decline has been constant over the years. Honduras' decline has been less accelerated than that of the other countries.

With the exception of El Salvador, most of the decline in infant mortality has been due to a decline in postneonatal mortality. It should be noted that in Honduras there has been no decline in the neonatal mortality rate since the 1986–1990 period. In Nicaragua, while postneonatal mortality declined by 23 deaths per 1,000 live births between the first and the last period shown in the table, neonatal mortality declined by only four deaths. Corresponding figures for Guatemala are nine and four deaths, respectively.

El Salvador emerges as the only country with a substantial decline in neonatal mortality, from 23 infant deaths per 1,000 live births in 1988–1993 to 13 deaths per 1,000 in 1997–2002.

## *Mortality Differentials*

Table 8.2 shows mortality rates by area of residence, according to the last survey conducted in each country. El Salvador is the only country where the urban and rural infant mortality rates do not differ. In all of the other countries, the rural rates exceed urban rates, ranging from nine deaths per 1,000 live births in Honduras to 15 deaths per 1,000 in Guatemala, with Nicaragua not far behind with a differential of 14 deaths per 1,000. With the exception of El Salvador, child mortality rates are also higher in the rural area compared to the urban area. The lack of a rural/urban difference in El Salvador appears to be related to general improvements in education,

**Table 8.2**  
**Infant and Child Mortality Estimates, According to Area of Residence**  
**(Most Recent Survey)**

Country/Area	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
<b>El Salvador</b>	2002/03	1997–2002					
Total			13	12	25	6	31
Urban			14	11	24	6	31
Rural			13	11	24	6	30
<b>Guatemala</b>	2002	1997–2002					
Total			22	16	39	15	53
Urban			20	9	29	12	40
Rural			24	20	44	16	59
<b>Honduras</b>	2001	1996–2000					
Total			19	15	34	11	45
Urban			15	14	29	8	36
Rural			22	16	38	13	51
<b>Nicaragua</b>	2001	1996–2001					
Total			16	15	31	7	38
Urban			14	10	24	3	27
Rural			18	20	38	12	49

\* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.

**Table 8.3**  
**Infant and Child Mortality Estimates, According to Education of**  
**Mother (Most Recent Survey)**

Country/ Education	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
<b>El Salvador</b>	2002/03	1997–2002					
Total			13	12	25	6	31
None			26	11	36	5	41
1–3			14	16	30	5	34
4–6			10	5	16	8	23
7–9			13	6	20	10	30
10+			6	17	23	3	26
<b>Guatemala</b>	2002	1997–2002					
Total			22	16	39	15	53
None			32	23	55	22	76
Primary			20	15	34	11	45
Secondary+			9	4	12	5	17
<b>Honduras</b>	2001	1996–2000					
Total			19	15	34	11	45
None			30	34	63	23	85
1–3			21	19	40	12	51
4–6			18	10	28	9	37
7+			12	6	18	4	22
<b>Nicaragua</b>	2001	1996–2001					
Total			16	15	31	7	38
None			23	30	53	14	66
1–3			15	19	34	9	42
4–6			14	11	26	7	32
7–9			8	7	16	2	17
10+			20	1	22	2	23
* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.							

socioeconomic conditions, prenatal care and hospital delivery services, as well as, fertility declines in rural areas in recent years. Analysis of trends in infant mortality by area of residence for El Salvador indicates that mortality decline took place primarily in rural areas since the mid 1990s.

Table 8.3 shows mortality rates according to mother's education. In all of the countries, infant mortality generally decreases as the education

of the mother increases. The differentials can be substantial. For example, in Honduras, the differential between the lowest and highest educational level shown in the table is 45 infant deaths per 1,000 live births, while in Guatemala it is 43 infant deaths. In Nicaragua, Honduras, and Guatemala, postneonatal mortality rates also show a very pronounced inverse relation with mother's education. For example, in both Nicaragua and Honduras, the difference

between the least and most educated women is 28–29 deaths per 1,000. Neonatal mortality differentials are less pronounced, with a high of 23 deaths per 1,000 in Guatemala, followed by successively smaller differentials in El Salvador, Honduras and Nicaragua, respectively.

Table 8.4 shows mortality rates, according to

age of mother at the time of the birth. Infant mortality is lowest among children of mothers aged 20–29, the prime ages of childbearing. In all of the countries, there is excess mortality for children born to women under age 20 and to women age 30 or older, especially to women aged 40–49.

**Table 8.4**  
**Infant and Child Mortality Estimates, According to Age of Mother at Birth**  
**(Most Recent Survey)**

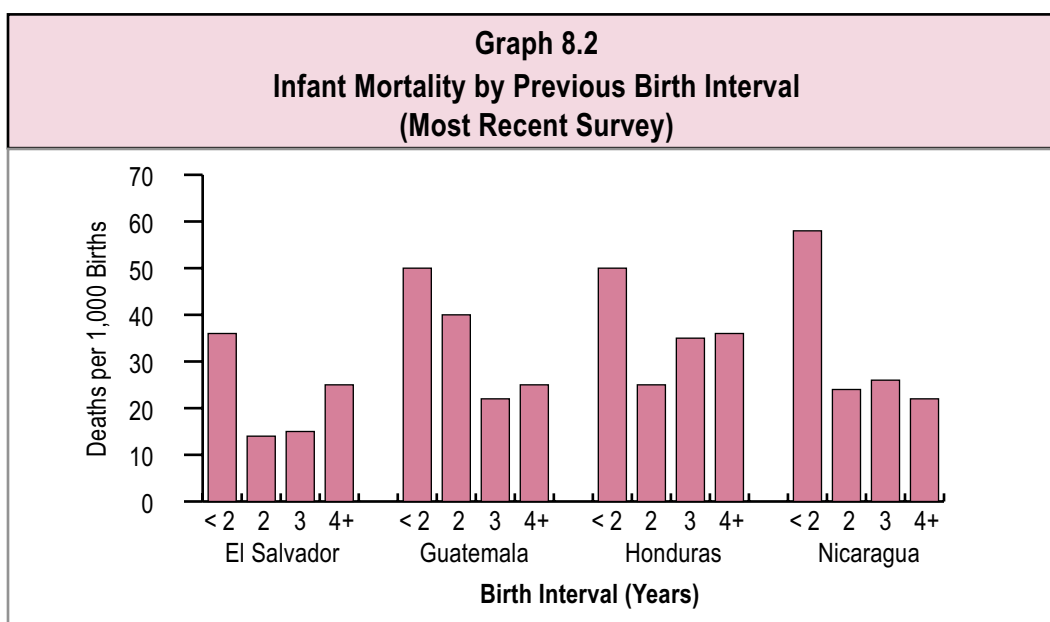
Country/Age	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
<b>El Salvador</b>	2002/03	1997–2002					
Total			13	12	25	6	31
<20			17	9	26	14	40
20–29			10	12	22	5	27
30–39			12	8	20	2	21
40–49			56	24	80	0	80
<b>Guatemala</b>	2002	1997–2002					
Total			22	16	39	15	53
<20			27	18	45	12	56
20–29			20	13	33	15	48
30–39			19	19	38	14	52
40–49			62	29	91	31	119
<b>Honduras</b>	2001	1996–2000					
Total			19	15	34	11	45
<20			20	23	43	8	51
20–29			15	10	25	10	34
30–39			22	17	39	17	55
40–49			50	37	87	11	97
<b>Nicaragua</b>	2001	1996–2001					
Total			16	15	31	7	38
<20			22	12	33	7	41
20–29			13	12	25	6	31
30–39			15	23	38	9	47
40–49			14	29	42	21	63
* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.							

**Table 8.5**  
**Infant and Child Mortality Estimates, According to Previous Birth Interval (Most Recent Survey)**

Country/ Interval	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
<b>El Salvador</b>	2002/03	1997–2002					
Total			13	12	25	6	31
< 2 Years			21	15	36	10	45
2–2.9 Years			7	8	14	8	22
3–3.9 Years			6	10	15	6	21
4+ Years			11	14	25	3	28
<b>Guatemala</b>	2002	1997–2002					
Total			22	16	39	15	53
< 2 Years			25	25	50	16	66
2–2.9 Years			21	19	40	15	55
3–3.9 Years			16	7	22	12	35
4+ Years			15	10	25	14	39
<b>Honduras</b>	2001	1996–2000					
Total			19	15	34	11	45
< 2 Years			26	24	50	16	66
2–2.9 Years			11	14	25	10	34
3–3.9 Years			16	18	35	9	43
4+ Years			27	10	36	13	48
<b>Nicaragua</b>	2001	1996–2001					
Total			16	15	31	7	38
< 2 Years			25	33	58	14	71
2–2.9 Years			11	13	24	10	34
3–3.9 Years			7	19	26	5	31
4+ Years			15	7	22	5	27
* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.							

Studies in many countries have found that the length of the preceding birth interval is strongly associated with infant mortality risks and that the interval of three to five years is optimal. Births occurring after a short birth interval, i.e.,

less than 24 months, have substantially higher mortality than births occurring after a longer interval. As shown in Table 8.5 and Graph 8.2, results from the most recent survey conducted in each country are consistent with these



studies. In Nicaragua, the infant mortality rate of children with a birth interval of less than 24 months is 58 while in Honduras and Guatemala it is at 50 infant deaths per 1,000 live births. Interestingly, the rate in El Salvador is only 36 deaths per 1,000, but remains substantially higher than children born with a preceding birth interval of 2 to 3 years.

As shown in Table 8.6, infant mortality generally increases as birth order of the child increases. The children at highest risk of dying are those who are the seventh or higher birth order child.

Finally, one would expect that infant mortality, and particularly neonatal mortality, would be lower to infants born in a medical facility compared to infants born outside of a medical



**Table 8.6**  
**Infant and Child Mortality Estimates, According to Birth Order**  
**(Most Recent Survey)**

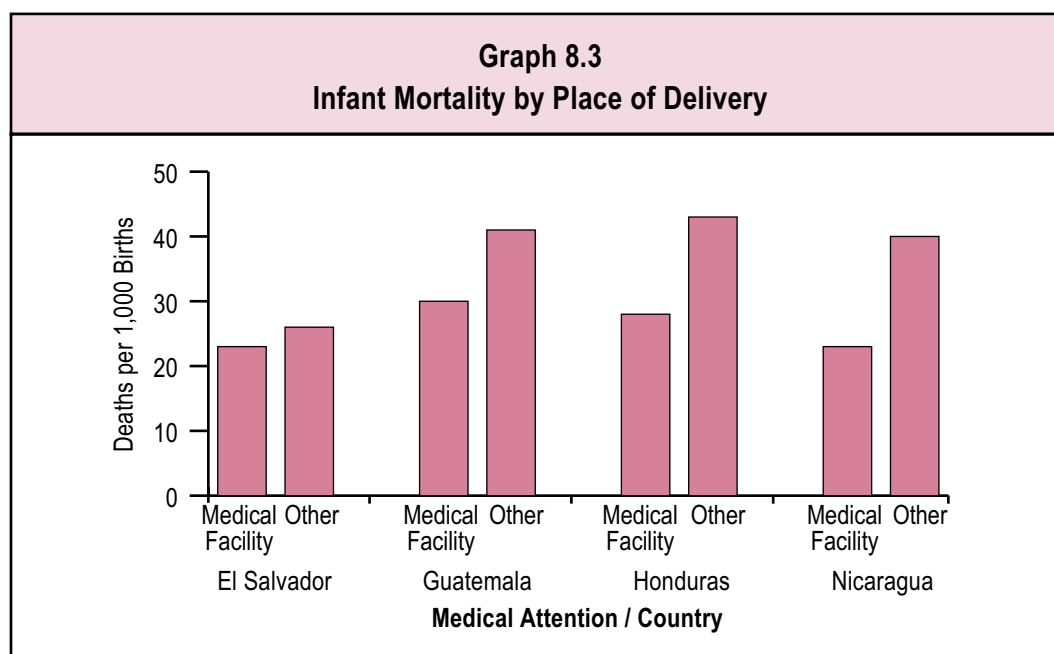
Country/Birth Order	Year of Survey	Time Period	Mortality Rates per 1,000*				
			Neonatal	Postneonatal	Infant	Child	Under 5
<b>El Salvador</b>	2002/03	1997–2002					
Total			13	12	25	6	31
1			12	10	22	6	27
2–3			12	11	23	9	31
4–6			9	13	23	4	26
7+			33	10	43	4	46
<b>Guatemala</b>	2002	1997–2002					
Total			22	16	39	15	53
1			29	14	43	13	55
2–3			17	13	30	11	41
4–6			23	20	43	18	61
7+			24	21	46	19	63
<b>Honduras</b>	2001	1996–2000					
Total			19	15	34	11	45
1			16	11	28	6	33
2–3			21	17	38	11	48
4–6			18	11	29	10	39
7+			21	29	50	25	74
<b>Nicaragua</b>	2001	1996–2001					
Total			16	15	31	7	38
1			17	8	25	3	29
2–3			16	12	28	6	34
4–6			11	16	26	7	33
7+			22	37	59	18	76
* Neonatal, postneonatal, infant and under-5 mortality rates are per 1,000 live births. Child mortality rates are per 1,000 children surviving to age 1.							

**Table 8.7**  
**Infant Mortality Estimates, According to Place**  
**of Birth (Most Recent Survey)**

Country/Place of Birth	Year of Survey	Time Period	Mortality Rates per 1,000*		
			Neonatal	Postneonatal	Infant
<b>El Salvador</b>	2002/03	1997–2002			
Total			13	12	25
Medical Facility			13	11	23
Other			13	13	26
<b>Guatemala</b>	2002	1997–2002			
Total			22	16	39
Medical Facility			22	9	30
Other			21	20	41
<b>Honduras</b>	2001	1996–2000			
Total			19	15	34
Medical Facility			16	13	28
Other			23	20	43
<b>Nicaragua</b>	2001	1996–2001			
Total			16	15	31
Medical Facility			14	9	23
Other			18	21	40
* Neonatal, postneonatal and infant mortality rates are per 1,000 live births.					

facility. According to the data shown in Table 8.7 and Graph 8.3, this is not necessarily the case in at least two of the countries. In El Salvador and Guatemala, there is no difference in the neonatal mortality rate between births occurring in a medical facility and those outside a medical facility, while in Nicaragua the difference (in favor of hospital births) is only four deaths per 1,000 live births, and increases to seven in Honduras. It is interesting to note the advantages

accrued to infants born in medical facilities during the postneonatal period in all four countries. With the exception of El Salvador, the associated advantages in survivorship by age 1 are substantial. In Guatemala, Honduras, and Nicaragua the infant mortality rates of children born outside medical facilities are 11, 15, and 17 deaths per 1,000 live births higher, respectively, than their counterparts born in medical facilities.



## ***Perinatal Mortality***

The perinatal mortality rate measures the number of perinatal deaths per 1,000 births. The perinatal period starts at 28 weeks gestation and ends at the end of the seventh day after delivery. Perinatal deaths are the sum of stillbirths plus early neonatal deaths. Perinatal mortality rates have long been used as an indicator of the standard of maternal and newborn care. The incidence of perinatal deaths is generally higher among the babies of mothers

who do not receive prenatal care, among male babies, and among first births and fifth or more pregnancies. Maternal age is another important factor associated with perinatal mortality. The high risk groups are mothers over the age of 40 and teenage mothers. Rates can be as low as 6 per 1,000 births in some developed countries, but are considerably higher in the developing world.

<b>Table 8.8</b> <b>Perinatal Mortality Estimates, According to Area of Residence</b> <b>(Most Recent Survey)</b>					
Country/Area	Year of Survey	Time Period	Perinatal Mortality Rates*		
			Stillbirth	Died 0–7 Days	Total
<b>El Salvador</b>	2002/03	1997–2002			
Total			12	11	23
Urban			6	12	18
Rural			18	9	27
<b>Guatemala</b>	2002	1997–2002			
Total			18	17	35
Urban			16	17	33
Rural			19	18	36
<b>Honduras</b>	2001	1996–2000			
Total			16	14	30
Urban			13	12	25
Rural			18	14	32
<b>Nicaragua</b>	2001	1996–2001			
Total			10	11	21
Urban			9	11	20
Rural			10	12	22
* The number of early neonatal deaths (first seven days of life) and still births (defined as pregnancy losses occurring after the sixth month of pregnancy) per 1,000 viable pregnancies (live births and still births) that occurred during the reference period.					

According to the last survey conducted in each country, perinatal mortality varied from a low of 23 deaths per 1,000 births in El Salvador to a high of 35 deaths in Guatemala (Table 8.8). In general, there are more stillbirths than deaths

to infants during the first seven days of life. In each country, the rural perinatal mortality rate is greater than the urban rate, although the urban/rural differential in Guatemala is relatively small.

## *Summary of Findings*

- Survey estimates of mortality were computed for the 5-year period preceding the last survey conducted in each country. Infant mortality estimates were lowest for El Salvador and Nicaragua (25 and 31 deaths per 1,000 live births) and higher for Honduras and Guatemala (34 and 39 deaths per 1,000).
- All of the countries have experienced a systematic decline in levels of infant mortality over the past decade and a half, with the largest decline taking place in Nicaragua and the smallest decline in Honduras.
- With the exception of El Salvador, most of the decline in infant mortality has been due to a decline in postneonatal mortality. Currently, the neonatal mortality rate in each of the countries is higher than the postneonatal mortality rate.
- The most significant infant mortality differentials were associated with the mother's education, followed by previous birth interval and area of residence. In all of the countries, infant mortality generally decreases as the education of the mother increases and as the previous birth interval increases. The data suggest that the best time to have a baby is between 20 and 29 years of age.
- Perinatal mortality is relatively high in the four countries, ranging from 23 deaths per 1,000 births in El Salvador to a high of 35 deaths per 1,000 in Guatemala.

